

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Original) A method for discriminating between textual content and graphical content in an image comprising:

receiving a plurality of pixel values for a pixel line segment;
calculating a plurality of spatial gradients based on pixel values of adjacent pixels;
determining a smoothness index by processing the plurality of spatial gradients; and
identifying the pixel line segment as one of a text segment or a graphic segment by comparing the smoothness index to a threshold value.

2. (Original) The method of claim 1 wherein the step of calculating a plurality of spatial gradients comprises the step of subtracting an adjacent pixel value from a current pixel value for each of the plurality of pixel values.

3. (Currently Amended) The method of claim 1 wherein the step of determining a smoothness index comprises:

calculating a first statistical characteristic of the plurality of spatial gradients;
calculating a second statistical characteristic of the plurality of spatial gradients;
dividing the second statistical characteristic by the first statistical characteristic to generate the smoothness index.

4. (Original) The method of claim 3 wherein calculating a first statistical characteristic comprises:

squaring each of the spatial gradients to generate a plurality of squared gradients; and
generating the first statistical characteristic by summing the squared gradients.

5. (Original) The method of claim 3 wherein calculating a second statistical characteristic comprises:

generating a plurality of absolute gradients by determining an absolute value of each of the spatial gradients;

determining a sum value by summing the absolute gradients; and

generating the second statistical characteristic by squaring the sum value.

6. (Original) A method for discriminating between textual content and graphical content in an image comprising:

receiving a first plurality of pixel values for a pixel line segment and a second plurality of pixel values for the pixel line segment;

calculating a plurality of spatial gradients for the pixel line segment based on the first plurality of pixel values of adjacent pixels;

determining a smoothness index by processing the plurality of spatial gradients;

calculating a value by combining the second plurality of pixel values; and

identifying the pixel line segment as one of a text segment or a graphic segment by comparing the smoothness index to a first threshold value and the calculated value of the second plurality of the pixel values to a second threshold value.

7. (Original) The method of claim 6 wherein the step of calculating a plurality of spatial gradients comprises the step of subtracting an adjacent pixel value from a current pixel value for each of the first plurality of pixel values.

8. (Currently Amended) The method of claim 6 wherein the step of determining a smoothness index comprises:

calculating a first statistical characteristic of the plurality of spatial gradients;
calculating a second statistical characteristic of the plurality of spatial gradients;
dividing the second statistical characteristic by the first statistical characteristic to generate the smoothness index.

9. (Original) The method of claim 8 wherein calculating a first statistical characteristic comprises:

squaring each of the spatial gradients to generate a plurality of squared gradients; and
generating the first statistical characteristic by summing the squared gradients.

10. (Original) The method of claim 9 wherein calculating a second statistical characteristic comprises:

generating a plurality of absolute gradients by determining an absolute value of each of the spatial gradients;

determining a sum value by summing the absolute gradients; and
generating the second statistical characteristic by squaring the sum value.

11. (Original) The method of claim 6 wherein the step of calculating a value by combining the second plurality of pixel values further comprises the step of calculating the maximum of the second plurality of pixel values.

12. (Original) The method of claim 6 further comprising the steps of:

receiving a third plurality of pixel values for the pixel line segment; and
calculating a value by combining the third plurality of pixel values, and wherein the step of identifying the pixel line segment as one of a text segment or a graphic segment further

comprises comparing the calculated value of the third plurality of pixel values to a third threshold value.

13. (Original) The method of claim 12 wherein the step of calculating a value by combining the third plurality of pixel values comprises the step of calculating the maximum of the third plurality of pixel values.

14. (New) An apparatus for discriminating between textual content and graphical content in an image comprising:

a converter for receiving a plurality of pixel values for a pixel line segment;

a separator module for calculating a plurality of spatial gradients based on pixel values of adjacent pixels, a smoothness index by processing the plurality of spatial gradients, and identifying the pixel line segment as one of a text segment or a graphic segment by comparing the smoothness index to a threshold value.

15. (New) The apparatus of claim 14 wherein the separator module calculates the spatial gradients by subtracting an adjacent pixel value from a current pixel value for each of the plurality of pixel values.

16. (New) The apparatus of claim 14 wherein the separator module calculates the smoothness index by:


calculating a first statistical characteristic of the plurality of spatial gradients;

calculating a second statistical characteristic of the plurality of spatial gradients;

dividing the second statistical characteristic by the first statistical characteristic to generate the smoothness index.

17. (New) The apparatus of claim 16 wherein calculating a first statistical characteristic comprises:

squaring each of the spatial gradients to generate a plurality of squared gradients; and
generating the first statistical characteristic by summing the squared gradients.

 18. (New) The apparatus of claim 16 wherein calculating a second statistical characteristic comprises:

generating a plurality of absolute gradients by determining an absolute value of each of the spatial gradients;

determining a sum value by summing the absolute gradients; and

generating the second statistical characteristic by squaring the sum value.
